

GLENDIVE MICROWAVE

DAWSON COUNTY

The Glendive Microwave site was located about 10 miles east of Glendive at 47°08'14"N and 104°32'45"W (Site No. 25 on Map II-1). Elevation at the site was 2,611 feet.

The area is rugged, badlands country, and access to the site is difficult, especially in the winter. Interstate Highway 94 runs to the south of the site. The land is mostly privately owned, although some sections of state-owned lands are scattered throughout the area.

A Montana-Dakota Utilities Company 57 kV transmission line runs within several miles of the site. The site itself was located at a microwave communications tower. The nearest commercial airport is at Glendive about 10 miles away.

Wind data were collected at the site by the Montana Air Quality Bureau from July 26, 1975, to September 14, 1977. The data set contains hourly averages for wind speed and wind direction manually reduced from strip-chart records. The data were collected by a Meteorology Research, Inc., mechanical wind speed and direction recording unit. Anemometer height was 4 meters.

Overall data recovery during the period was poor—only 35.6 percent. No data were collected during January. Winds were monitored long enough at this site to provide an indication of the wind resource at this location, but care must be used in interpreting this data. The site was located on an exposed, elevated ridge and is representative of similarly exposed areas around the site.

Average monthly wind speeds at this site ranged from 9.8 miles per hour in November to 14.2 miles per hour in March. Average annual wind speed was 12.2 miles per hour. March and April were the windiest months, while the calmest months were September and November.

Average annual wind power at the site was 168.5 watts/m². Average monthly wind power values ranged from 91.5 watts/m² in November to 272.0 watts/m² in March.

Average seasonal wind speeds were 11.0 miles per hour in autumn, 11.9 miles per hour in summer, 12.4 miles per hour in winter, and 13.7 miles per hour in spring. The highest average wind speeds occurred in late morning during spring and autumn, in mid-morning during the summer, and in early evening during the winter. The lowest average wind speeds occurred in early evening during the autumn, in late evening during spring and summer, and in the early morning during the winter. The diurnal range of average wind speeds was greatest in spring and least in summer.

Winds from the south-southwest and west-northwest were most common. Winds from the northeast and east were least common. By direction, average wind speeds ranged from 9.4 miles per hour for northeasterly winds to 15.6 miles per hour for southeasterly winds.

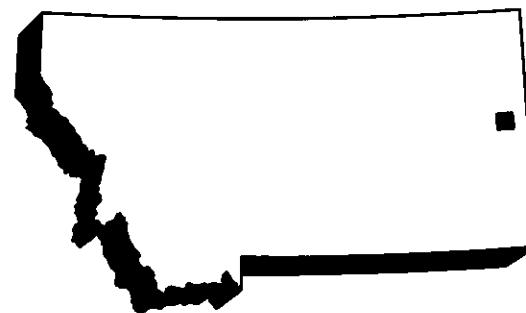


Table IV - 36
Monthly Wind Speed Distribution
DAWSON COUNTY - GLENDIVE MICROWAVE
07/26/75 - 09/14/77

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
CALM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	CALM
0.1-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1- 0.4
1.1-2.0	0.0	0.0	0.0	0.5	0.8	0.1	0.3	0.8	0.1	0.2	0.4	0.0	0.3	0.5- 0.9
2.1-3.0	0.0	1.9	1.5	0.6	1.5	1.2	0.7	2.7	1.9	1.2	3.1	0.7	1.6	1.0- 1.3
3.1-4.0	0.0	4.3	1.5	1.6	3.4	2.6	2.0	4.0	5.1	5.3	5.9	2.6	3.6	1.4- 1.8
4.1-5.0	0.0	4.3	2.1	2.7	5.5	4.1	4.1	5.2	4.5	4.1	7.7	2.1	4.3	1.9- 2.2
5.1-6.0	0.0	4.3	4.8	3.3	3.1	3.5	5.8	6.1	5.8	3.2	6.4	4.0	4.7	2.3- 2.7
6.1-7.0	0.0	6.2	5.4	2.7	4.8	4.6	4.8	6.4	5.1	4.9	7.9	3.5	5.1	2.8- 3.1
7.1-8.0	0.0	3.8	5.7	5.0	4.4	5.1	5.6	6.6	5.3	3.9	7.5	2.6	5.2	3.2- 3.6
8.1-9.0	0.0	5.0	5.4	4.4	5.5	5.0	7.7	6.3	8.0	6.5	7.5	5.0	6.1	3.7- 4.0
9.1-10.0	0.0	4.8	5.4	5.2	4.8	5.6	9.0	6.8	8.6	6.1	6.6	4.9	6.3	4.1- 4.5
10.1-11.0	0.0	8.9	5.1	7.4	6.1	6.2	10.0	7.4	8.9	7.5	8.6	6.6	7.6	4.6- 4.9
11.1-12.0	0.0	7.4	5.4	6.7	5.7	5.1	7.3	5.7	7.5	7.0	5.5	7.3	6.4	5.0- 5.4
12.1-13.0	0.0	7.7	4.8	6.6	6.1	6.3	6.5	5.1	5.9	6.3	6.1	7.1	6.1	5.5- 5.8
13.1-14.0	0.0	7.0	3.9	6.3	8.2	7.2	6.5	6.3	4.9	7.0	4.8	9.4	6.5	5.9- 6.3
14.1-15.0	0.0	7.7	5.4	6.3	6.5	8.2	4.6	3.9	4.4	5.4	3.5	7.6	5.6	6.4- 6.7
15.1-16.0	0.0	5.3	4.8	5.2	5.9	6.9	3.4	3.5	6.4	6.6	2.2	5.6	5.1	6.8- 7.2
16.1-17.0	0.0	4.3	4.5	5.0	3.1	5.7	3.4	3.6	2.9	5.1	3.3	5.9	4.2	7.3- 7.6
17.1-18.0	0.0	4.3	3.9	4.5	4.0	4.0	2.7	3.0	2.6	4.3	5.0	5.7	3.9	7.7- 8.0
18.1-19.0	0.0	4.1	3.9	4.9	4.6	2.8	2.4	2.7	3.6	4.1	2.6	4.9	3.6	8.1- 8.5
19.1-20.0	0.0	2.6	3.0	2.8	1.3	2.3	1.2	2.7	1.8	2.7	2.2	4.9	2.5	8.6- 8.9
20.1-25.0	0.0	5.3	16.6	13.1	7.4	10.1	11.2	7.5	5.6	4.8	3.1	8.7	8.3	9.0-11.2
25.1-30.0	0.0	0.7	3.9	4.2	5.3	3.1	0.7	2.4	0.5	2.7	0.0	1.0	2.2	11.3-13.4
30.1-35.0	0.0	0.0	2.4	1.3	1.7	0.1	0.0	1.1	0.4	1.0	0.2	0.0	0.7	13.5-15.6
35.1-40.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.0	15.7-17.9
>40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	>17.9
AVERAGE SPEED (MPH)	ND	11.6	14.2	14.0	12.9	12.8	11.7	11.5	10.9	12.1	9.8	13.0	12.2	
AVERAGE SPEED (M/SEC)	ND	5.2	6.3	6.3	5.8	5.7	5.2	5.1	4.9	5.4	4.4	5.8	5.4	
AVERAGE WIND POWER (WATTS/MM ²)	ND	135.8	272.0	237.5	215.0	175.1	138.3	155.9	116.2	171.7	91.5	175.5	168.5	
PERCENT DATA RECOVERY	0.0	30.5	22.2	44.4	35.2	47.3	36.6	51.3	41.1	39.5	31.7	38.7	35.6	

ANEMOMETER HEIGHT = 4 METERS = 13 FEET

NUMBER OF OBSERVATIONS = 6673

PERCENTAGE DATA RECOVERY = 35.6

SOURCE: GEORESEARCH, INC.

Table IV - 37
Percentage Frequency Summary for Wind Speed
DAWSON COUNTY - GLENDIVE MICROWAVE (WINTER)

07/26/75 - 09/14/77

	CALM	WIND SPEED (MPH)															AV (MPH)	AV (M/SEC)	
		0.1- 2.0	2.1- 4.0	4.1- 6.0	6.1- 8.0	8.1- 10.0	10.1- 12.0	12.1- 14.0	14.1- 16.0	16.1- 18.0	18.1- 20.0	20.1- 25.0	25.1- 30.0	30.1- 35.0	35.1- 40.0	>40.0			
	CALM	0.1- 0.9	0.0- 1.8	1.8- 2.7	2.7- 3.6	3.6- 4.5	4.5- 5.4	5.4- 6.3	6.3- 7.2	7.2- 8.0	8.1- 8.9	9.0- 11.2	11.2- 13.4	13.5- 15.6	15.7- 17.9	>17.9			
	1	0.0	0.0	0.0	7.3	9.8	9.8	22.0	19.5	9.8	12.2	7.3	2.4	0.0	0.0	0.0	11.9	5.3	
	2	0.0	0.0	7.3	4.9	9.8	12.2	14.6	19.5	12.2	4.9	4.9	9.8	0.0	0.0	0.0	0.0	11.8	5.3
	3	0.0	0.0	9.8	7.3	4.9	12.2	22.0	12.2	12.2	2.4	9.8	7.3	0.0	0.0	0.0	0.0	11.6	5.2
	4	0.0	0.0	12.2	7.3	2.4	22.0	12.2	14.6	4.9	4.9	2.4	17.1	0.0	0.0	0.0	0.0	11.6	5.2
	5	0.0	0.0	9.8	9.8	12.2	4.9	17.1	14.6	12.2	0.0	7.3	12.2	0.0	0.0	0.0	0.0	11.5	5.1
	6	0.0	0.0	7.3	4.9	17.1	9.8	7.3	14.6	9.8	9.8	12.2	4.9	2.4	0.0	0.0	0.0	11.9	5.3
	7	0.0	0.0	9.8	2.4	14.6	7.3	14.6	9.8	14.6	9.8	12.2	4.9	0.0	0.0	0.0	0.0	11.8	5.3
	8	0.0	0.0	4.9	9.8	14.6	2.4	14.6	24.4	17.1	4.9	4.9	0.0	2.4	0.0	0.0	0.0	11.2	5.0
H	9	0.0	0.0	2.4	19.5	0.0	14.6	12.2	14.6	19.5	9.8	2.4	2.4	2.4	0.0	0.0	0.0	11.4	5.1
O	10	0.0	0.0	4.9	12.2	7.3	0.0	17.1	14.6	17.1	7.3	9.8	4.9	4.9	0.0	0.0	0.0	12.7	5.7
O	11	0.0	0.0	4.9	9.8	4.9	4.9	12.2	19.5	12.2	7.3	19.5	2.4	2.4	0.0	0.0	0.0	12.9	5.8
U	12	0.0	0.0	4.9	12.2	7.3	2.4	9.8	14.6	22.0	7.3	9.8	9.8	0.0	0.0	0.0	0.0	12.8	5.7
U	13	0.0	0.0	12.2	2.4	4.9	9.8	17.1	9.8	17.1	4.9	12.2	9.8	0.0	0.0	0.0	0.0	12.6	5.6
R	14	0.0	0.0	4.9	12.2	4.9	7.3	17.1	19.5	12.2	7.3	7.3	4.9	2.4	0.0	0.0	0.0	12.2	5.5
R	15	0.0	0.0	2.4	12.2	2.4	12.2	9.8	14.6	19.5	14.6	4.9	7.3	0.0	0.0	0.0	0.0	12.5	5.6
	16	0.0	0.0	2.4	9.5	4.8	14.3	7.1	11.9	11.9	16.7	9.5	11.9	0.0	0.0	0.0	0.0	13.1	5.9
	17	0.0	0.0	2.4	11.9	2.4	14.3	9.5	11.9	7.1	19.0	11.9	9.5	0.0	0.0	0.0	0.0	13.2	5.9
	18	0.0	0.0	0.0	4.8	7.1	11.9	19.0	16.7	2.4	9.5	19.0	7.1	2.4	0.0	0.0	0.0	13.5	6.0
	19	0.0	0.0	2.4	0.0	4.8	9.5	14.3	16.7	9.5	21.4	7.1	11.9	2.4	0.0	0.0	0.0	14.1	6.3
	20	0.0	0.0	2.4	0.0	9.5	9.5	14.3	11.9	14.3	16.7	7.1	14.3	0.0	0.0	0.0	0.0	13.7	6.1
	21	0.0	0.0	2.4	4.8	4.8	9.5	9.5	16.7	21.4	14.3	11.9	4.8	0.0	0.0	0.0	0.0	13.2	5.9
	22	0.0	0.0	0.0	4.8	7.1	11.9	19.0	21.4	9.5	19.0	2.4	4.8	0.0	0.0	0.0	0.0	12.5	5.6
	23	0.0	0.0	0.0	2.4	14.3	7.1	28.6	14.3	14.3	9.5	4.8	4.8	0.0	0.0	0.0	0.0	12.2	5.4
	24	0.0	0.0	0.0	0.0	14.3	16.7	16.7	19.0	11.9	14.3	2.4	4.8	0.0	0.0	0.0	0.0	12.1	5.4
ALL HOURS		0.0	0.0	4.5	7.2	7.8	9.9	14.9	15.7	13.1	10.4	8.5	7.3	0.9	0.0	0.0	12.4	5.6	

SOURCE: GEORESEARCH, INC.

Table IV - 38

Percentage Frequency Summary for Wind Speed

DAWSON COUNTY - GLENDIVE MICROWAVE (SPRING)

07/26/75 - 09/14/77

	CALM	WIND SPEED (MPH)															AV SPEED (MPH)	AV SPEED (M/SEC)	
		0.1- 2.0	2.1- 4.0	4.1- 6.0	6.1- 8.0	8.1- 10.0	10.1- 12.0	12.1- 14.0	14.1- 16.0	16.1- 18.0	18.1- 20.0	20.1- 25.0	25.1- 30.0	30.1- 35.0	35.1- 40.0	>40.0			
		WIND SPEED (M/SEC)																	
	CALM	0.1- 0.9	0.0- 1.8	1.8- 2.7	2.7- 3.6	3.6- 4.5	4.5- 5.4	5.4- 6.3	6.3- 7.2	7.2- 8.0	8.1- 8.9	9.0- 11.2	11.2- 13.4	13.5- 15.6	15.7- 17.9	>17.9			
1	0.0	0.0	8.1	6.5	16.1	6.5	11.3	8.1	16.1	9.7	1.6	12.9	3.2	0.0	0.0	0.0	12.3	5.5	
2	0.0	1.6	4.8	8.1	12.9	11.3	9.7	16.1	6.5	11.3	3.2	11.3	1.6	1.6	0.0	0.0	12.4	5.5	
3	0.0	1.6	8.1	8.1	8.1	12.9	12.9	9.7	8.1	14.5	4.8	6.5	3.2	1.6	0.0	0.0	12.3	5.5	
4	0.0	1.6	6.5	6.5	14.5	8.1	12.9	8.1	14.5	12.9	1.6	8.1	0.0	4.8	0.0	0.0	12.4	5.6	
5	0.0	0.0	8.2	9.8	8.2	8.2	9.8	9.8	11.5	13.1	6.6	9.8	1.6	3.3	0.0	0.0	12.9	5.8	
6	0.0	1.6	6.6	4.9	9.8	11.5	9.8	8.2	16.4	4.9	4.9	14.8	4.9	1.6	0.0	0.0	13.5	6.0	
7	0.0	0.0	3.2	11.3	6.5	3.2	22.6	8.1	9.7	6.5	3.2	19.4	4.8	1.6	0.0	0.0	14.0	6.3	
8	0.0	0.0	3.2	6.5	11.3	3.2	16.1	16.1	6.5	6.5	12.9	9.7	6.5	1.6	0.0	0.0	14.0	6.2	
H	9	0.0	0.0	0.0	8.1	9.7	6.5	6.5	19.4	16.1	8.1	6.5	9.7	9.7	0.0	0.0	0.0	14.5	6.5
O	10	0.0	0.0	0.0	3.2	6.5	9.7	17.7	6.5	17.7	9.7	6.5	11.3	8.1	3.2	0.0	0.0	15.2	6.8
U	11	0.0	0.0	0.0	3.2	3.2	9.7	17.7	11.3	12.9	9.7	8.1	8.1	12.9	3.2	0.0	0.0	15.9	7.1
R	12	0.0	1.6	0.0	3.2	4.8	11.3	9.7	14.5	12.9	6.5	9.7	12.9	8.1	3.2	1.6	0.0	15.9	7.1
	13	0.0	1.6	0.0	6.6	3.3	11.5	9.8	14.8	13.1	9.8	4.9	8.2	9.8	6.6	0.0	0.0	15.6	7.0
	14	0.0	0.0	0.0	4.9	11.5	3.3	6.6	18.0	11.5	3.3	16.4	14.8	6.6	3.3	0.0	0.0	15.8	7.1
	15	0.0	0.0	1.6	4.9	6.6	9.8	8.2	6.6	19.7	6.6	13.1	13.1	6.6	3.3	0.0	0.0	15.6	7.0
	16	0.0	0.0	4.9	1.6	9.8	9.8	11.5	11.5	13.1	9.8	13.1	9.8	3.3	1.6	0.0	0.0	14.1	6.3
	17	0.0	0.0	0.0	6.3	15.9	11.1	12.7	12.7	9.5	3.2	9.5	14.3	4.8	0.0	0.0	0.0	13.6	6.1
	18	0.0	0.0	0.0	6.3	10.9	14.1	9.4	14.1	10.9	6.3	7.8	17.2	3.1	0.0	0.0	0.0	13.7	6.1
	19	0.0	0.0	3.1	7.8	6.3	14.1	12.5	15.6	9.4	4.7	10.9	14.1	1.6	0.0	0.0	0.0	13.2	5.9
	20	0.0	0.0	6.3	7.8	4.7	14.1	14.1	14.1	6.3	17.2	0.0	12.5	3.1	0.0	0.0	0.0	12.7	5.7
	21	0.0	0.0	6.3	10.9	6.3	15.6	15.6	10.9	9.4	7.8	4.7	10.9	1.6	0.0	0.0	0.0	12.0	5.4
	22	0.0	1.6	0.0	11.1	14.3	7.9	19.0	14.3	3.2	12.7	1.6	12.7	1.6	0.0	0.0	0.0	12.1	5.4
	23	0.0	0.0	3.2	11.1	7.9	14.3	12.7	15.9	9.5	6.3	6.3	9.5	3.2	0.0	0.0	0.0	12.4	5.5
	24	0.0	0.0	6.3	11.1	6.3	14.3	11.1	14.3	12.7	1.6	7.9	14.3	0.0	0.0	0.0	0.0	12.2	5.4
ALL HOURS		0.0	0.5	3.3	7.1	9.0	10.1	12.5	12.4	11.5	8.4	6.9	11.9	4.6	1.7	0.1	0.0	13.7	6.1

SOURCE: GEORESEARCH, INC.

Table IV - 39
Percentage Frequency Summary for Wind Speed
DAWSON COUNTY - GLENDIVE MICROWAVE (SUMMER)
07/26/75 - 09/14/77

	CALM	WIND SPEED (MPH)														AV SPEED (MPH)	AV SPEED (M/SEC)	
		0.1- 2.0	2.1- 4.0	4.1- 6.0	6.1- 8.0	8.1- 10.0	10.1- 12.0	12.1- 14.0	14.1- 16.0	16.1- 18.0	18.1- 20.0	20.1- 25.0	25.1- 30.0	30.1- 35.0	35.1- 40.0	>40.0		
	CALM	WIND SPEED (M/SEC)																
		0.1- 0.9	0.0- 1.8	1.8- 2.7	2.7- 3.6	3.6- 4.5	4.5- 5.4	5.4- 6.3	6.3- 7.2	7.2- 8.0	8.1- 8.9	9.0- 11.2	11.2- 13.4	13.5- 15.6	15.7- 17.9	>17.9		
1	0.0	0.0	4.0	17.0	9.0	15.0	10.0	13.0	11.0	5.0	7.0	8.0	1.0	0.0	0.0	0.0	11.3	5.1
2	0.0	1.0	6.0	10.0	13.0	16.0	10.0	12.0	8.0	8.0	4.0	11.0	0.0	1.0	0.0	0.0	11.5	5.1
3	0.0	2.0	7.0	11.0	8.0	7.0	18.0	18.0	9.0	7.0	5.0	8.0	0.0	0.0	0.0	0.0	11.4	5.1
4	0.0	1.0	10.0	5.0	12.0	12.0	15.0	14.0	9.0	8.0	9.0	4.0	1.0	0.0	0.0	0.0	11.2	5.0
5	0.0	3.0	6.1	6.1	14.1	7.1	18.2	14.1	9.1	14.1	2.0	5.1	1.0	0.0	0.0	0.0	11.2	5.0
6	0.0	1.0	10.1	9.1	9.1	12.1	13.1	13.1	13.1	6.1	5.1	7.1	0.0	1.0	0.0	0.0	11.2	5.0
7	0.0	1.0	9.1	14.1	11.1	5.1	13.1	9.1	12.1	9.1	6.1	8.1	1.0	0.0	0.0	0.0	11.6	5.2
8	0.0	0.0	4.0	14.1	7.1	16.2	10.1	11.1	13.1	8.1	5.1	8.1	2.0	1.0	0.0	0.0	12.0	5.4
H	0.0	0.0	2.0	7.1	13.1	11.1	12.1	14.1	4.0	13.1	5.1	13.1	4.0	1.0	0.0	0.0	13.3	5.9
O	0.0	0.0	3.0	5.9	6.9	17.8	15.8	13.9	7.9	4.0	5.9	13.9	4.0	1.0	0.0	0.0	13.1	5.9
U	0.0	0.0	1.0	12.9	13.9	9.9	14.9	14.9	7.9	5.9	5.0	8.9	3.0	2.0	0.0	0.0	12.4	5.5
U	0.0	0.0	1.0	9.9	10.9	15.8	20.8	7.9	6.9	4.0	8.9	9.9	2.0	2.0	0.0	0.0	12.6	5.6
R	0.0	0.0	1.0	15.8	8.9	17.8	11.9	9.9	5.9	5.9	3.0	14.9	4.0	1.0	0.0	0.0	12.5	5.6
R	0.0	0.0	3.9	13.7	8.8	14.7	12.7	6.9	9.8	7.8	2.9	13.7	3.9	1.0	0.0	0.0	12.4	5.5
R	0.0	0.0	2.9	10.8	14.7	8.8	10.8	14.7	8.8	6.9	2.9	13.7	4.9	0.0	0.0	0.0	12.7	5.7
R	0.0	0.0	2.9	7.8	21.6	7.8	11.8	6.9	15.7	6.9	2.9	12.7	2.0	1.0	0.0	0.0	12.4	5.6
R	0.0	0.0	5.9	11.8	11.8	7.8	13.7	8.8	12.7	7.8	4.9	9.8	3.9	1.0	0.0	0.0	12.4	5.5
R	0.0	0.0	2.9	11.8	10.8	13.7	9.8	10.8	9.8	12.7	3.9	8.8	3.9	0.0	1.0	0.0	12.7	5.7
R	0.0	0.0	4.0	4.0	11.9	11.9	20.8	9.9	12.9	6.9	5.9	9.9	2.0	0.0	0.0	0.0	12.5	5.6
R	0.0	0.0	4.0	4.0	14.9	18.8	13.9	19.8	5.0	7.9	5.0	5.0	2.0	0.0	0.0	0.0	11.4	5.1
R	0.0	0.0	6.9	13.7	8.8	16.7	13.7	11.8	5.9	6.9	5.9	8.8	1.0	0.0	0.0	0.0	11.1	5.0
R	0.0	1.0	7.0	10.0	12.0	18.0	14.0	10.0	9.0	6.0	3.0	9.0	1.0	0.0	0.0	0.0	10.9	4.9
R	0.0	1.0	8.0	5.0	9.0	21.0	10.0	15.0	16.0	5.0	4.0	4.0	2.0	0.0	0.0	0.0	11.2	5.0
R	0.0	1.0	6.0	8.0	13.0	16.0	13.0	17.0	11.0	3.0	5.0	4.0	3.0	0.0	0.0	0.0	11.2	5.0
ALL HOURS	0.0	0.5	4.9	9.9	11.4	13.3	13.6	12.3	9.7	7.3	4.9	9.2	2.2	0.6	0.0	0.0	11.9	5.3

SOURCE: GEORESEARCH, INC.

Table IV - 40

Percentage Frequency Summary for Wind Speed

DAWSON COUNTY - GLENDIVE MICROWAVE (AUTUMN)

07/26/75 - 09/14/77

	CALM	WIND SPEED (MPH)														AV SPEED (MPH)	AV SPEED (M/SEC)		
		0.1- 2.0	2.1- 4.0	4.1- 6.0	6.1- 8.0	8.1- 10.0	10.1- 12.0	12.1- 14.0	14.1- 16.0	16.1- 18.0	18.1- 20.0	20.1- 25.0	25.1- 30.0	30.1- 35.0	35.1- 40.0				
	CALM	0.1- 0.9	0.0- 1.8	1.8- 2.7	2.7- 3.6	3.6- 4.5	4.5- 5.4	5.4- 6.3	6.3- 7.2	7.2- 8.0	8.1- 8.9	9.0- 11.2	11.2- 13.4	13.5- 15.6	15.7- 17.9	>17.9	AV (MPH)	AV (M/SEC)	
	1	0.0	0.0	8.0	12.0	10.7	13.3	8.0	14.7	13.3	6.7	5.3	5.3	2.7	0.0	0.0	11.3	5.0	
	2	0.0	0.0	2.7	16.2	9.5	13.5	9.5	14.9	9.5	10.8	8.1	4.1	1.4	0.0	0.0	11.5	5.1	
	3	0.0	0.0	2.7	8.1	18.9	12.2	13.5	6.8	13.5	12.2	5.4	5.4	1.4	0.0	0.0	11.5	5.1	
	4	0.0	0.0	4.1	8.1	14.9	14.9	16.2	5.4	16.2	9.5	6.8	1.4	1.4	1.4	0.0	0.0	11.5	5.1
	5	0.0	1.4	4.1	6.8	16.2	14.9	16.2	16.2	8.1	8.1	2.7	2.7	2.7	0.0	0.0	11.0	4.9	
	6	0.0	0.0	5.4	8.1	10.8	17.6	16.2	13.5	6.8	8.1	8.1	2.7	2.7	0.0	0.0	11.3	5.0	
	7	0.0	0.0	5.4	8.1	9.5	9.5	20.3	16.2	9.5	6.8	8.1	4.1	2.7	0.0	0.0	11.7	5.2	
H	8	0.0	0.0	1.4	9.5	13.5	13.5	16.2	14.9	9.5	8.1	8.1	5.4	0.0	0.0	0.0	11.4	5.1	
O	9	0.0	0.0	4.1	8.2	11.0	13.7	16.4	13.7	8.2	11.0	8.2	4.1	1.4	0.0	0.0	11.7	5.2	
O	10	0.0	1.4	2.7	6.8	11.0	13.7	15.1	12.3	12.3	9.6	5.5	6.8	2.7	0.0	0.0	12.1	5.4	
U	11	0.0	0.0	2.8	6.9	8.3	13.9	19.4	11.1	8.3	13.9	6.9	5.6	2.8	0.0	0.0	12.4	5.6	
U	12	0.0	0.0	5.6	4.2	8.3	16.7	15.3	6.9	15.3	11.1	9.7	5.6	0.0	1.4	0.0	12.4	5.5	
R	13	0.0	0.0	2.7	8.2	11.0	19.2	13.7	8.2	15.1	9.6	5.5	5.5	0.0	1.4	0.0	11.8	5.3	
R	14	0.0	0.0	5.5	11.0	11.0	17.8	17.8	8.2	11.0	8.2	1.4	6.8	0.0	1.4	0.0	10.9	4.9	
R	15	0.0	1.4	12.3	11.0	8.2	17.8	12.3	9.6	9.6	4.1	4.1	8.2	0.0	0.0	1.4	0.0	10.6	4.7
	16	0.0	0.0	6.8	17.8	9.6	15.1	12.3	12.3	8.2	5.5	4.1	6.8	0.0	1.4	0.0	10.4	4.7	
	17	0.0	0.0	9.6	9.6	13.7	15.1	17.8	9.6	5.5	4.1	9.6	4.1	0.0	1.4	0.0	10.7	4.8	
	18	0.0	0.0	5.3	10.7	24.0	18.7	14.7	6.7	8.0	1.3	5.3	4.0	1.3	0.0	0.0	9.8	4.4	
	19	0.0	0.0	14.7	10.7	13.3	17.3	17.3	9.3	8.0	2.7	1.3	5.3	0.0	0.0	0.0	9.4	4.2	
	20	0.0	0.0	14.7	17.3	6.7	10.7	20.0	12.0	6.7	4.0	5.3	2.7	0.0	0.0	0.0	9.4	4.2	
	21	0.0	0.0	12.0	14.7	8.0	16.0	16.0	9.3	9.3	5.3	2.7	6.7	0.0	0.0	0.0	10.0	4.5	
	22	0.0	0.0	14.7	14.7	5.3	16.0	8.0	16.0	8.0	6.7	5.3	2.7	1.3	0.0	0.0	10.3	4.6	
	23	0.0	1.3	12.0	9.3	6.7	8.0	21.3	14.7	9.3	6.7	2.7	4.0	1.3	2.7	0.0	11.1	5.0	
	24	0.0	0.0	16.0	8.0	8.0	12.0	10.7	17.3	9.3	6.7	6.7	2.7	1.3	1.3	0.0	10.7	4.8	
	ALL HOURS	0.0	0.2	7.3	10.3	11.2	14.6	15.2	11.7	9.9	7.5	5.7	4.7	1.1	0.6	0.1	0.0	11.0	4.9

SOURCE: GEORESEARCH, INC.

Table IV - 41

Annual Wind Rose Distribution

DAWSON COUNTY - GLENDIVE MICROWAVE

07/26/75 - 09/14/77

DIRECTION>	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	<DIRECTION	
	SPEED (MPH)																	SPEED (M/SEC)	
	0.1- 1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1- 0.4	
	1.1- 2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	1.1	0.5- 0.9	
	2.1- 3.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.5	0.1	0.3	0.3	0.3	0.1	0.1	2.5	1.0- 1.3	
	3.1- 4.0	0.2	0.1	0.1	0.2	0.1	0.3	0.1	0.3	0.5	0.6	0.2	0.5	0.3	0.6	0.1	0.1	4.4	1.4- 1.8
S	4.1- 5.0	0.2	0.3	0.1	0.3	0.1	0.1	0.0	0.4	0.4	0.8	0.1	0.7	0.3	0.3	0.1	0.1	4.5	1.9- 2.2
P	5.1- 6.0	0.3	0.3	0.1	0.4	0.2	0.2	0.0	0.4	0.3	0.6	0.2	0.5	0.4	0.5	0.1	0.5	5.2	2.3- 2.7
E	6.1- 7.0	0.2	0.3	0.2	0.6	0.1	0.3	0.1	0.5	0.4	0.5	0.2	0.5	0.3	0.4	0.1	0.3	5.0	2.8- 3.1
E	7.1- 8.0	0.3	0.4	0.3	0.4	0.1	0.3	0.2	0.7	0.4	0.6	0.2	0.6	0.3	0.6	0.2	0.4	5.9	3.2- 3.6
D	8.1- 9.0	0.3	0.3	0.4	0.6	0.2	0.3	0.2	0.5	0.6	0.6	0.3	0.6	0.4	0.4	0.2	0.4	6.3	3.7- 4.0
M	9.1-10.0	0.3	0.3	0.3	0.6	0.3	0.6	0.2	0.5	0.7	0.9	0.3	0.6	0.4	0.6	0.2	0.4	7.3	4.1- 4.5
M	10.1-11.0	0.1	0.4	0.2	0.2	0.2	0.7	0.6	0.6	0.5	1.0	0.3	0.6	0.3	0.6	0.2	0.4	6.8	4.6- 4.9
I	11.1-12.0	0.2	0.3	0.1	0.2	0.1	0.8	0.4	0.5	0.6	1.0	0.4	0.7	0.3	0.5	0.2	0.3	6.5	5.0- 5.4
L	12.1-13.0	0.1	0.4	0.1	0.2	0.1	0.9	0.6	0.6	0.8	1.0	0.3	0.4	0.2	0.5	0.2	0.2	6.7	5.5- 5.8
E	13.1-14.0	0.3	0.1	0.2	0.2	0.1	0.7	0.4	0.4	0.6	1.1	0.2	0.4	0.2	0.6	0.2	0.2	5.9	5.9- 6.3
S	14.1-15.0	0.3	0.2	0.1	0.3	0.2	0.7	0.4	0.3	0.4	0.7	0.2	0.3	0.3	0.5	0.1	0.3	5.3	6.4- 6.7
/	15.1-16.0	0.1	0.1	0.0	0.2	0.2	0.5	0.4	0.4	0.3	0.6	0.2	0.3	0.2	0.6	0.2	0.3	4.5	6.8- 7.2
H	16.1-17.0	0.3	0.3	0.0	0.1	0.1	0.5	0.2	0.4	0.3	0.4	0.2	0.2	0.2	0.6	0.1	0.1	4.0	7.3- 7.6
O	17.1-18.0	0.1	0.2	0.0	0.1	0.1	0.3	0.3	0.3	0.2	0.5	0.2	0.2	0.2	0.4	0.3	0.1	3.6	7.7- 8.0
U	18.1-19.0	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.2	0.2	0.4	0.1	0.3	0.1	0.4	0.2	0.1	2.8	8.1- 8.5
R	19.1-20.0	0.1	0.1	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.3	0.0	0.2	0.1	0.4	0.1	0.1	2.0	8.6- 8.9
	20.1-25.0	0.5	0.3	0.0	0.1	0.1	0.8	0.8	0.8	0.1	0.3	0.1	0.4	0.6	1.1	0.4	0.3	6.7	9.0-11.2
	25.1-30.0	0.2	0.0	0.0	0.0	0.0	0.1	0.4	0.4	0.0	0.0	0.0	0.1	0.2	0.3	0.1	0.2	2.2	11.3-13.4
	30.1-35.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.7	13.5-15.6
	35.1-40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.7-17.9
	>40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	>17.9	
	CALM															0.0	CALM		
	TOTAL	4.3	4.7	2.4	5.1	2.5	8.6	5.9	8.7	7.6	12.6	3.9	8.6	5.7	10.5	3.5	5.3	100.0	TOTAL
AV SPD (MPH)	13.7	11.4	9.4	9.9	11.6	13.8	15.6	12.6	10.8	11.2	11.1	10.6	12.1	13.2	14.1	12.2	12.2	AV SPD (MPH)	
AV SPD (M/S)	6.1	5.1	4.2	4.4	5.2	6.2	7.0	5.7	4.8	5.0	4.9	4.8	5.4	5.9	6.3	5.4	5.4	AV SPD (M/S)	

SOURCE: GEORESEARCH, INC.

Figure IV - 4
Annual Wind Rose Distribution
GLENDIVE MICROWAVE — DAWSON COUNTY
(1975 - 1977)

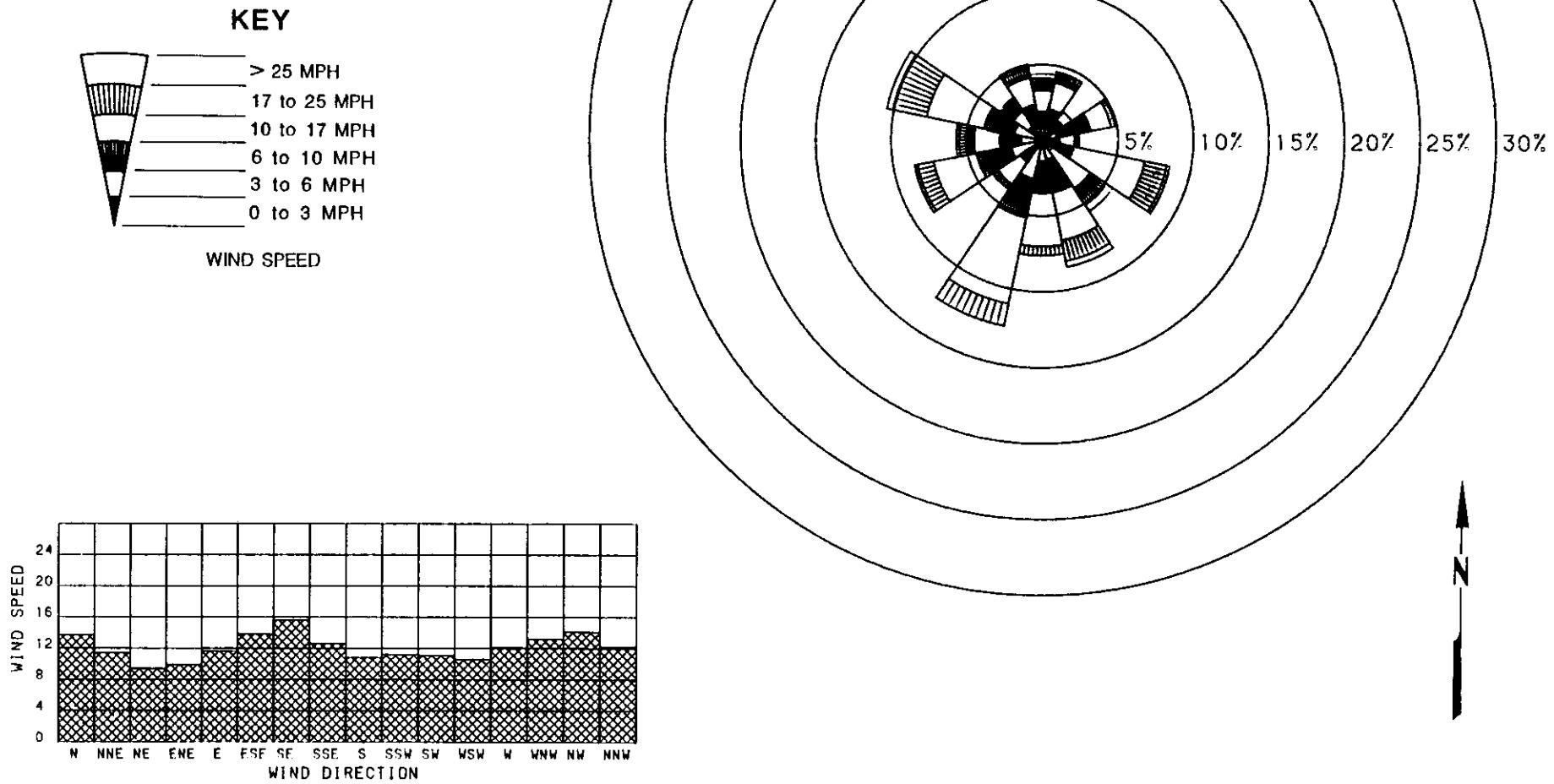


Table IV - 42
Coefficients of Weibull Distribution
DAWSON COUNTY - GLENDIVE MICROWAVE

07/26/75 - 09/14/77

MONTH	SCALE FACTOR (C) (M/SEC)	SHAPE FACTOR (K)
JANUARY	ND	ND
FEBRUARY	6.2243	2.4371
MARCH	7.1117	2.0366
APRIL	6.9616	2.4669
MAY	6.5302	2.1645
JUNE	6.6135	2.4287
JULY	5.5014	2.5443
AUGUST	5.6390	1.9999
SEPTEMBER	5.5526	2.2842
OCTOBER	6.3426	2.3552
NOVEMBER	5.0772	2.0432
DECEMBER	5.4250	2.4484
YEAR	5.4542	2.0683

SOURCE: GEORESEARCH, INC.